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## Congenital Cardiology Solutions

### A RANDOMIZED CLINICAL TRIAL OF REGIONAL CEREBRAL PERFUSION VERSUS DEEP HYPOTHERMIC CIRCULATORY ARREST: FIVE-YEAR FOLLOW-UP FOR NEURODEVELOPMENTAL OUTCOMES IN CHILDREN WITH FUNCTIONAL SINGLE VENTRICLE

Oral Contributions

North, Room 121

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**Background:** Regional cerebral perfusion (RCP) has been endorsed as a method to improve cerebral protection during neonatal aortic arch reconstruction. However, no human study has demonstrated improvement in developmental outcomes with RCP. We aimed to: 1. Compare early school-age (ESA) neurodevelopmental outcomes among children with single ventricle who underwent the Norwood operation with RCP rather than deep hypothermic circulatory arrest (DHCA), 2. Determine the predictive value of early developmental testing, and 3. Identify additional contributors to ESA development.

**Methods:** Children enrolled in the RCP randomized controlled trial of infants with single ventricle undergoing the Norwood operation with randomization to aortic arch reconstruction with either RCP or DHCA were included. A comprehensive neuropsychological evaluation was performed at ages 5-8 years with this analysis focusing on the Wechsler Intelligence Scales. Additional candidate predictors were investigated as associated with impaired neurodevelopment with chi square and t tests for categorical and continuous variables respectively.

**Results:** Forty-one patients returned for ESA follow-up. The overall mean full scale IQ was  $93.4 \pm 18.8$  with a mean verbal IQ of  $95.9 \pm 17.6$ , a mean performance IQ of  $94.5 \pm 19.2$ , and a mean processing speed IQ of  $92.5 \pm 15.2$ . There were no statistical differences between the RCP and DHCA groups. The one year Bayley Scale of Infant Development Psychomotor Development Index ( $r = 0.68$ ,  $p < 0.0001$ ) and Mental Development Index ( $r = 0.64$ ,  $p < 0.0001$ ) correlated with the full scale IQ at ESA. Participants with lower socioeconomic status (SES) and those without fetal diagnosis had lower IQ scores. However, SES was higher for those with a fetal diagnosis.

**Conclusion:** Neurodevelopment is delayed after the Norwood operation without an associated improvement with RCP. Bayley Scale of Infant Development scores at 1 year predict ESA measures, though additional unmeasured factors likely explain a significant portion of ESA developmental outcomes. Fetal diagnosis and higher SES are associated with higher IQ scores, but the mechanism remains unclear as SES is higher among those with fetal diagnosis.